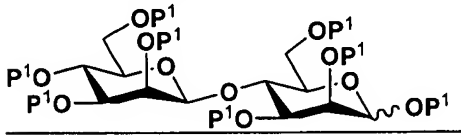
AMENDMENTS TO THE CLAIMS

1-2. (Cancelled)

3. (Currently amended) ~~The~~ A method for preparing a trisaccharide (Manβ1→4GlcNβ1→4GlcN) of a reducing terminal in a core sugar chain structure of an asparagine-linked glycoprotein, ~~of claim 2, further~~ comprising

(1) a process of preparing a mannose disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) of the formula (I)



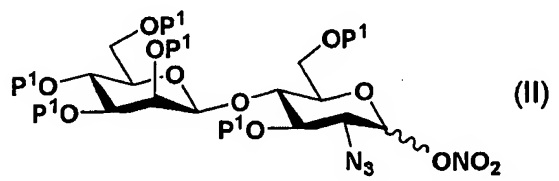
(I)

wherein P^1 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, trimethylsilyl and triethylsilyl, and the wavy line means that $-OP^1$ is linked at an axial or equatorial position, or mixture of both,

by hydrolyzing a polysaccharide having mannose β-1,4-bonds and protecting OH groups of the resulting hydrolysate,

(2) a process of preparing a glycal compound, in which mannose of a reducing terminal of the mannose disaccharide is converted to glycal, by halogenation and reduction of the mannose disaccharide (a type of $ManP^1\beta1\rightarrow4ManP^1$),

(3) a process of preparing an azide disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) shown with formula (II) in which a 2-azide group of mannose in a reducing terminal is linked at an equatorial position;



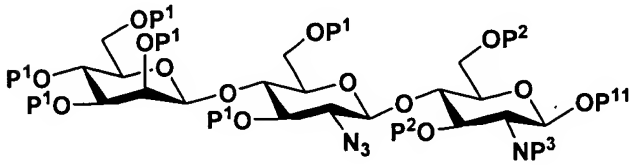
(II)

wherein P^1 is the same as described above, the wavy line means that $-ONO_2$ is linked at an axial or equatorial position, or mixture of both,

by azidenitration reaction of the glycal compound above,

(4) a process of substituting the nitro group of the azide disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) with a leaving group selected from the group consisting of fluorine atom, chlorine atom, trihaloacetoimidate, ~~pentenyl~~4- pentenyl, alkylthio and arylthio, and

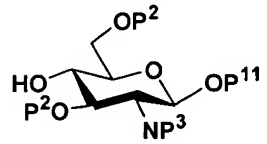
(5) a process of preparing a trisaccharide compound (a type of $Man\beta1\rightarrow4GlcNP^1\beta1\rightarrow4GlcNP^2$) shown with the formula (III);



(III)

wherein P^1 is an OH- protecting group, as described above, P^2 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, P^3 is an amino-protecting group selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^{11} is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl,

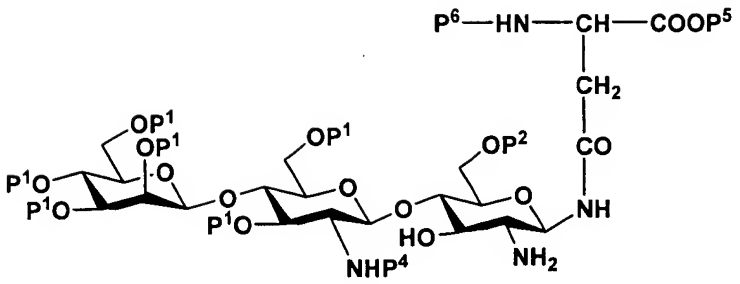
by a reaction of the product having the leaving group with amino-protected glucopyranoside shown with the formula;



wherein P^2, P^3 and P^{11} are the same as described above.

4. (Currently amended) The method for preparing a trisaccharide ($Man\beta1\rightarrow4GlcN\beta1\rightarrow4GlcN$) of a reducing terminal in a core sugar chain structure of an asparagine-linked glycoprotein of claim 3, further comprising

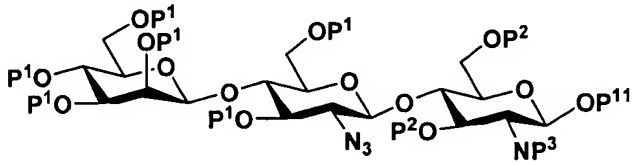
(6) a process of preparing an asparagine-linked trisaccharide ($Man\beta1\rightarrow4GlcNP^1\beta1\rightarrow4GlcNP^2$) compound shown with the formula (IV);



(IV)

wherein P^1 and P^2 are independently OH-protecting groups, as described above, P^4 and P^6 are independently amino-protecting groups selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^5 is a carboxyl-protecting group which is t-Bu,

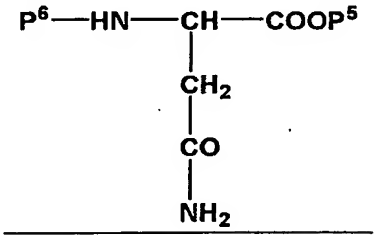
by deprotecting the P^{11} group of the compound (III),



(III)

wherein P^1, P^2 and P^{11} are independently OH-protecting groups, as described above, and P^3 is an amino-protecting group, as described above,

reducing the azide group to an amino group, protecting the amino group with an acetyl group, forming an oxazoline ring simultaneously with deprotecting a hydroxy group of a reducing terminal, and coupling with a protected asparagines derivative of the formula:



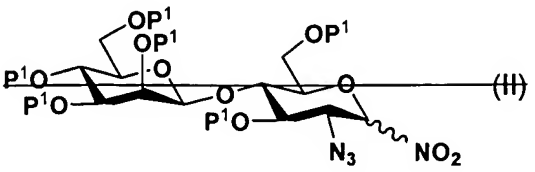
wherein P^5 and P^6 are the same as described above,

after introducing a -N=C=S group at the reducing terminal.

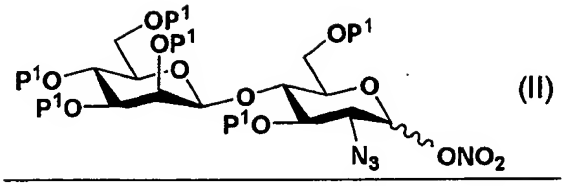
5. (Cancelled)

6. (Currently amended) A method for preparing an azide disaccharide (a type of $ManP^1\beta1\rightarrow4ManP^1$) shown with the formula (II) in which a 2-azide group of mannose in a

reducing terminal is linked at an equatorial position;



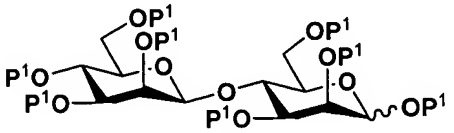
(II)



(II)

wherein P^1 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, and the wavy line means that ~~$-NO_2$~~ $-ONO_2$ is linked at an axial or equatorial position, or mixture of both,

comprising a process of preparing a glycal compound, in which mannose of the reducing terminal of the mannose disaccharide is converted to glycal, by halogenation and reduction of the mannose disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) shown with the formula (I);

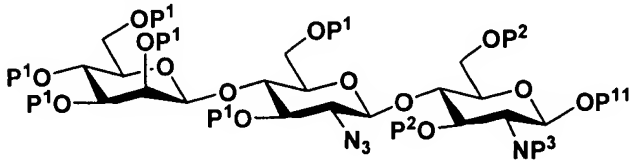


(I)

wherein P^1 is the same as described above and the wavy line means that $-OP^1$ is linked at an axial or equatorial position, or mixture of both,

and subsequent azidenitration reaction of the glycal compound.

7. (Currently amended) A method for preparing a trisaccharide compound shown with the formula (III);

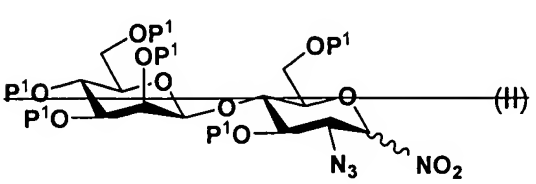


(III)

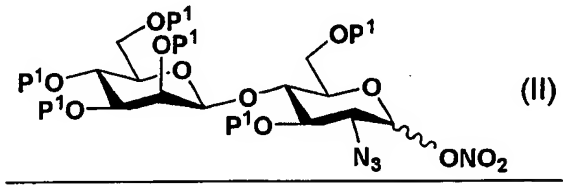
wherein P^1, P^2 and P^{11} are independently OH- protecting groups selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, and P^3 is an amino-protecting group selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl,

comprising a process of substituting the nitro group of the azide disaccharide compound (a type

of ManP^{1}β1→4ManP^1) shown with the formula (II) with a leaving group selected from the group consisting of fluorine atom, chlorine atom, trihaloacetoimidate, ~~pentenyl~~4- pentenyl, alkylthio and arylthio;



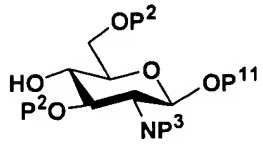
(II)



(II)

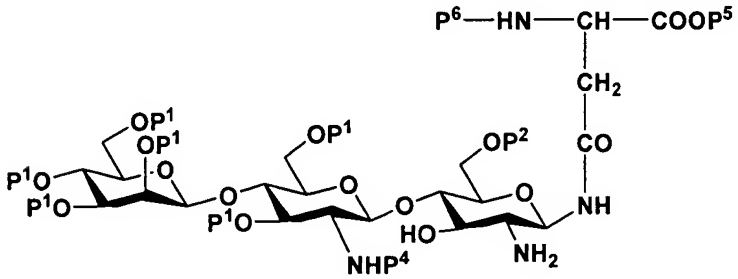
wherein P^1 is the same as described above, the wavy line means that ~~$-NO_2$~~ $-ONO_2$ is linked at an axial or equatorial position, or mixture of both, and a 2-azide group of mannose in the reducing terminal is linked at the equatorial position,

and next, reacting the substituted compound having the leaving group with amino-protected glucopyranoside of the formula;



wherein P^2, P^3 and P^{11} are the same as described above.

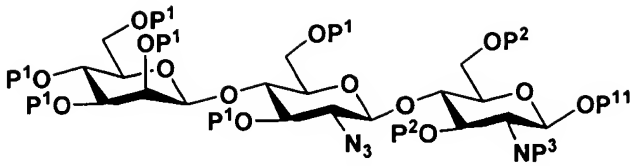
8. (Currently amended) A method for preparing an asparagine-linked trisaccharide compound (Manβ1→4GlcNP^{1}β1→4GlcNP^2) shown with the formula (IV)



(IV)

wherein P^1 and P^2 are independently OH- protecting groups selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, P^4 and P^6 are independently amino-protecting groups selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^5 is a carboxyl-protecting group which is t-Bu,

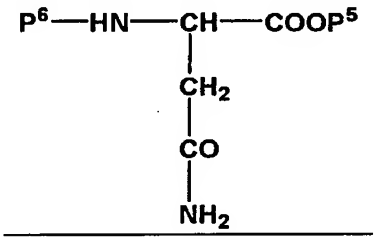
by deprotecting the P^{11} group of the compound (III),



(III)

wherein P^1 and P^2 are the same as described above, P^3 is an amino-protecting group selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^{11} is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl,

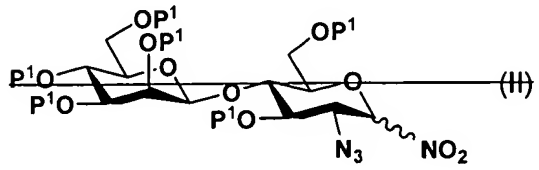
reducing the azide group to an amino group, protecting the amino group with an acetyl group, forming an oxazoline ring simultaneously with deprotecting a hydroxy group of a reducing terminal, and coupling with a protected asparagines derivative of the formula:

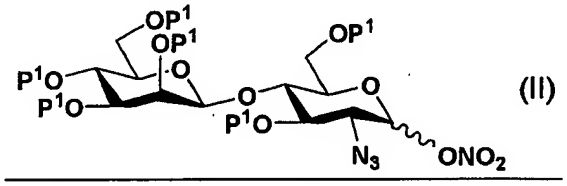


wherein P^5 and P^6 are the same as described above,

after introducing a -N=C=S group at the reducing terminal.

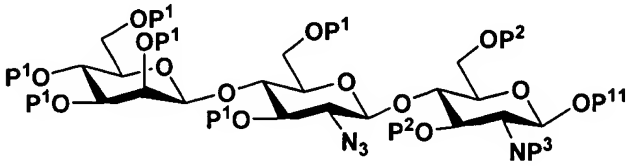
9. (Currently amended) An azide disaccharide (a type of $ManP^1\beta1\rightarrow4ManP^1$) compound shown with the formula (II);





wherein P^1 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, and the wavy line means that ~~$-NO_2$~~ $-ONO_2$ is linked at an axial or equatorial position, or mixture of both.

10. (Currently amended) A trisaccharide compound (a type of Manβ1→4GlcNP^{1}β1→4GlcNP^2) shown with the formula of (III);



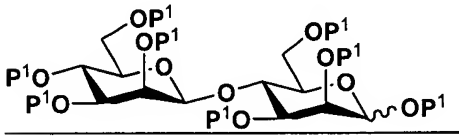
(III)

wherein P^1, P^2 and P^{11} are independently OH-protecting groups selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, and P^3 is an amino-protecting group selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl.

11-12. (Cancelled)

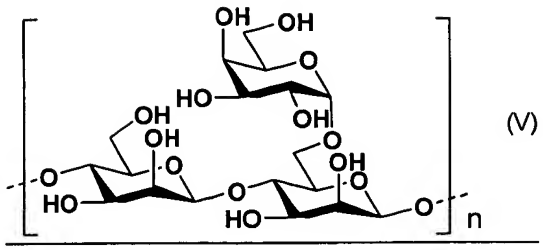
13. (Currently amended) ~~The~~ A method for preparing a trisaccharide (Manβ1→4GlcNβ1→4GlcN) of a reducing terminal in a core sugar chain structure of an asparagine-linked glycoprotein, ~~of claim 12, further~~ comprising

(1) a process of preparing a mannose disaccharide compound (a type of ManP^{1}β1→4ManP^1) of the formula (I)



(I)

wherein P^1 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, trimethylsilyl and triethylsilyl, and the wavy line means that -OP^1 is linked at an axial or equatorial position, or mixture of both, by hydrolyzing guar gum or galactomannan of the formula (V);



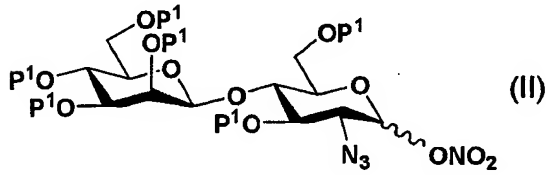
(V)

wherein n is an integer of 50 or more,

and protecting OH groups of the resulting hydrolysate.

(2) a process of preparing a glycal compound, in which mannose of a reducing terminal of the mannose disaccharide is converted to glycal, by halogenation and reduction of the mannose disaccharide (a type of $ManP^1\beta1\rightarrow4ManP^1$), and

(3) a process of preparing an azide disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) shown with formula (II) in which a 2-azide group of mannose in a reducing terminal is linked at an equatorial position;



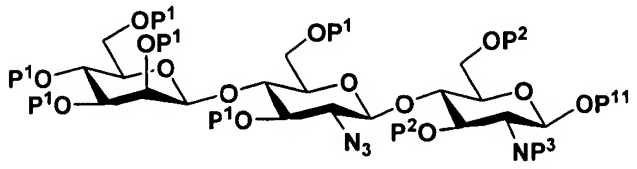
(II)

wherein P^1 is the same as described above, the wavy line means that $-ONO_2$ is linked at an axial or equatorial position, or mixture of both,

by azidenitration reaction of the glycal compound above,

(4) a process of substituting the nitro group of the azide disaccharide compound (a type of $ManP^1\beta1\rightarrow4ManP^1$) with a leaving group selected from the group consisting of fluorine atom, chlorine atom, trihaloacetoimidate, ~~pentenyl~~4- pentenyl, alkylthio and arylthio, and

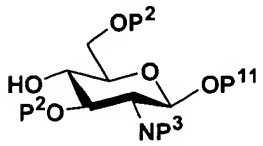
(5) a process of preparing a trisaccharide compound (a type of $Man\beta1\rightarrow4GlcNP^1\beta1\rightarrow4GlcNP^2$) shown with the formula (III);



(III)

wherein P^1 is an OH- protecting group, as described above, P^2 is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl, P^3 is an amino-protecting group selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^{11} is an OH-protecting group selected from the group consisting of acetyl, benzyl, 4-methoxybenzyl, benzoyl, methoxymethyl, tetrahydropyranyl, ~~trimethylsillyl~~ trimethylsilyl and triethylsilyl,

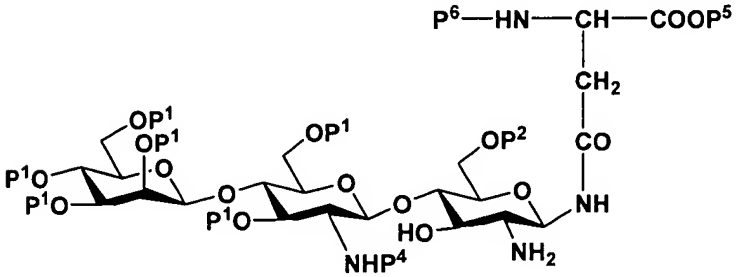
by a reaction of the product having the leaving group with amino-protected glucopyranoside shown with the formula;



wherein P^2, P^3, and P^{11} are the same as described above.

14. (Currently amended) The method for preparing a trisaccharide (Manβ1→4GlcNβ1→4GlcN) of a reducing terminal in a core sugar chain structure of an asparagine-linked glycoprotein of claim 13, further comprising

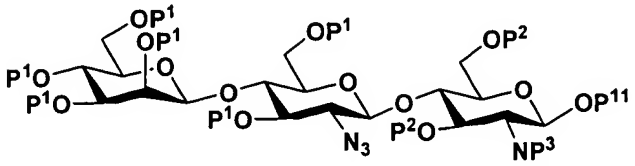
(6) a process of preparing an asparagine-linked trisaccharide (Manβ1→4GlcNP^{1}β1→4GlcNP^2) compound shown with the formula (IV);



(IV)

wherein P^1 and P^2 are independently OH- protecting groups, as described above, P^4 and P^6 are independently amino-protecting groups selected from the group consisting of phthalimide, tert-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl and benzyl, and P^5 is a carboxyl-protecting group which is t-Bu,

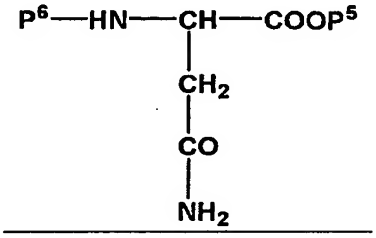
by deprotecting the P^{11} group of the compound (III),



(III)

wherein P^1, P^2 and P^{11} are independently OH- protecting groups, as described above, and P^3 is an amino-protecting group, as described above,

reducing the azide group to an amino group, protecting the amino group with an acetyl group, forming an oxazoline ring simultaneously with deprotecting a hydroxy group of a reducing terminal, and coupling with a protected asparagine derivative of the formula:



wherein P^5 and P^6 are the same as described above,

after introducing a –N=C=S group at the reducing terminal.